

NEW TECHNIQUE FOR PRODUCING GASTRIC ULCERATIONS IN THE
WHITE RAT: THE ULCER OF CONSTRAINT

G. Rossi, S. Bonfils, F. Lieffogh, and A. Lambling

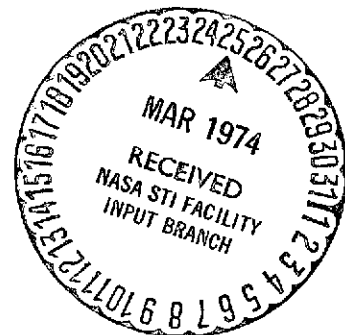
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16. Abstract A new technique for producing gastric ulceration, under the action of a mechanism which uses little violence, consists of the immobilization of a rat in wire netting for 20 hours. Forty-two out of 44 rats exhibited clear ulcerations of the gastric ventricle, permitting the assumption that a fundamental mechanism of gastric functioning has been touched.			
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NEW TECHNIQUE FOR PRODUCING GASTRIC ULCERATIONS IN THE
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There are quite a number of techniques for producing experi- /2124*
mental gastric ulcers in the rat. However, they depend on a
small number of principles [1]: direct action on the stomach
(vascular ligation, ligation of the pylorus, etc); administration
of drugs, whose toxicity for the stomach can moreover make its
influence felt by means of various mechanisms (atophan [1],
phenylbutazone [2], cortisone, Δ -cortisone [3]; violent traumatic
shock launching a stress (Selye)). All of these methods call into
action mechanisms far removed from the ones that we assume are
playing a role in human pathology.

The technique that we propose partly escapes the latter re-
proach. Furthermore, it possesses the advantage of extreme
simplicity and produces constant results.

Technique

We are using white female rats (Wistar) weighing 130 to 160 g.
The animal, which has not been subjected to any particular pre-
paration, is immobilized in a flexible wire mesh (ladder-type wire/2125
netting). Four holes have been punched at the location of their
paws that protrude from their roots on down. The paws are attached
to each other, two by two, by means of a strip of adhesive tape.
Then the wire netting is flanged over the back of the animal,
without pressing it, in a tight fit around the outside of the body.
This fastening is also held in position by means of adhesive plas-
ter. This entire period of the operation is done under light
anesthesia by ether.

* Numbers in the margin indicate pagination in the foreign text.

The animal which is immobilized in this manner is suspended horizontally in a burette stand in such a way that its paws do not touch the ground.

Then 2.5 cm³ of physiological salt solution is injected in each rear paw. The rat rests in this way for 20 hours before being sacrificed, without having received any food or drink; 2.5 cm³ of physiological salt solution is injected in the rear paw at the beginning of the experiment.

Findings

We have a homogeneous group of 50 animals that have been studied in ten series of experiments.

a) Death rate. Of 50 animals, five have died in the course of the experiment, their death delayed for different periods of time. Two died as early as the sixth hour, already exhibiting gastric ulcerations.

b) Rate of ulceration. Out of the 44 remaining animals, which had been subjected to the experimental procedure as we have described it, 42 exhibited unmistakable gastric ulcerations. The other two suffered from tiny lesions, but, nevertheless, blood was found in considerable quantities in the stomach.

c) Character of the lesions. The ulcerations are seated on the glandular portion of the stomach or ventricle, which they can affect at any point of its surface. We are dealing with black lesions, sometimes clearly hollow, sometimes composed of a hematic infiltration of the same topography which, however, still appears interstitial: a discrete pressure on this magma succeeds in eliminating and loosening the ulceration.

The ulcers are always in multiples and of unequal size. The main and most common lesions are located in a symmetrical manner on the front and rear in the form of stria strung out over 5 to 6 mm in accordance with the axis of the curve and from 1 to 4 mm wide. On the rest of the ventricle, the ulcerations are usually smallest in size, punctiforms the size of the large head of a pin.

Such aspects as these have none of the characteristics of our technique. For that matter, they are all to be observed in the course of other methods of experimental ulcers (phenylbutazone, cortisone, Δ -cortisone).

Interpretation

The ease and constancy with which these ulcerations occurred under the influence of an action that, on the surface, uses so little violence, lets us presume, however, that a fundamental mechanism of gastric functioning and trophism has been touched. The possible factors for the formation of lesions are:

a) dehydration, generation of hemoconcentration and, in that way, disturbance of vascularization;

b) an endocrine disturbance of the type that has been described by Selye on the occasion of "stress;"

c) a nervous disturbance, either of the autonomic nervous system (of the syndrome of the Reilly type), or through the process of the corticovisceral relationship. The latter mechanism, though it concerns the rat, seems to us all the more interesting to study because it is impossible with the other techniques of experimental ulcers to accurately define the existence and the importance of them.

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